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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,315	10/24/2001	Chris Baldwin	884.537US1	1252
21186	7590	11/17/2003	EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402			NADAV, ORI	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 11/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

10/045,315

Applicant(s)

BALDWIN, CHRIS

Examiner

ori nadav

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-13 and 15-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-13 and 15-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 7-13 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Saith et al., Dobbin, II et al. (6,452,113) and Dwarves (6,400,033).

Regarding claims 7 and 18, AAPA teaches in figure 2 and related text an electronic package comprising: an interposer 24 being a tape and having an upper surface and a lower surface; a die 22 secured to the upper surface of the interposer; a pin carrier 28 having a cavity, the pin carrier being secured to the lower surface of the interposer such that the cavity is against the interposer opposite to the die; an electronic component 28 secured to the lower surface of the interposer, the electronic component being positioned within the cavity in the pin carrier.

AAPA does not teach an encapsulant at least partially filling the cavity to support an interposer having a thickness of less than 1mm such that the interposer is capable of withstanding a mechanical load generated by thermal elements and is incapable of withstanding the mechanical load without the encapsulant.

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Saith et al. teach in figure 8 and related text an encapsulant 25 at least partially filling the cavity.

Dobbin, II et al. teach an encapsulant providing mechanical strength and at least partially filling the area between the interposer/substrate and the die (column 7, lines 26-28).

Dwarves teaches an encapsulant providing mechanical strength that prevents the bending of the substrate (column 1, lines 57-59).

Regarding claims 10 and 20, Saith et al. teach a resin being epoxy (column 6, line 17).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an interposer having a thickness of less than 1mm and to at least partially fill the cavity of AAPA's device with an encapsulant, in order to minimize the inductive loop between the capacitor and the die and in order to mechanically support the interposer, respectively. The combination is motivated by the teaching of AAPA which point out the advantages of forming a thin enough interposer (page 3) and by the teachings of Dobbin, II et al. and Dwarves who point out the advantages of using an under fill.

Note that an artisan fills the cavity with an encapsulant to support the interposer when the interposer is incapable of withstanding the mechanical load that is formed thereon. The interposer normally withstands a mechanical load generated by conventional elements formed thereon such as thermal elements, because this is the function of the encapsulant.

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Regarding claims 8-9, 11-13 and 16, AAPA teaches an interposer is a composite metal and organic material, wherein the electronic component is a capacitor and the interposer is thin enough to minimize the inductive loop between the capacitor and the die, wherein the pin carrier is attached to the interposer using a ball grid array of solder balls, wherein the cavity in the pin carrier includes a perimeter and the die includes a perimeter substantially aligned with the perimeter of the cavity (in the horizontal direction), wherein the cavity in the pin carrier includes a perimeter and the die includes a perimeter that is smaller than the perimeter of the cavity (in the vertical direction)

Regarding claims 17 and 19, AAPA teaches an interposer being thin enough in order to minimize the inductive loop between the capacitor and the die.

Regarding claim 15, AAPA teaches a data processing system comprising a memory, a processor; and a package including an interposer. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to connect the various elements of the data processing system in AAPA's device via a bus in order to be able to operate the device.

Regarding claims 10 and 20, Saith et al. teach a resin being epoxy (column 6, line 17). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use epoxy resin in AAPA's device in order to be able to provide adequate strength and support to the device.

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Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is (703) 308-8138. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday. Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is 308-0956.



O.N.
November 4, 2003

ORI NADAV
PATENT EXAMINER
TECHNOLOGY CENTER 2800